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www.opticis.com

# DVI/USB/RS-232 and Audio Optical Extender

*User's Manual*
*for the M5-1003*

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## Welcome!

Congratulations on your purchase of the M5-1003, DVI/USB/RS-232 and audio optical extender. This manual contains information that will assist you in installing and operating the product.

## Product Description

M5-1003 offers extremely long extension of DVI, USB, serial control data and audio up to 2 km (6,560ft) over single-mode fiber cables with two (2) duplex LC connectors. It is tremendously long over the limits of copper extensions like a few of meter of DVI and USB.

Designed for high resolution performance, it guarantees lossless image quality and no frame dropping to deliver perfect graphic data transmission up to WUXGA (1920x1200) at 60Hz refresh rate. It is designed to multiplex and de-multiplex DVI, USB, RS232 and stereo audio so as to be linked over four (4) single-mode LC fibers at 1310nm/1550nm. It provides Self-EDID programming feature that makes the installation of M5-1003 more easy and flexile at any variable resolution.

Optionally, we could include convenient remote console switch and indicator for selecting local control or remote control.

**Shipping Group** of M5-1003 DVI/USB/Audio and RS-232 optical extender

- ☐ **Tx and Rx boxes:** One Transmitter module & One Receiver module.
- ☐ **AC/DC power adapter:** Two +12V/3A units (including AC cord).
- ☐ **User's Manual**
- ☐ **Bracket:** two (2) large seize and two (2) small seize brackets
- ☐ **Option:** Remote console switch and indicator, Duplex LC Patch Cord (Single or Multi mode glass fiber).

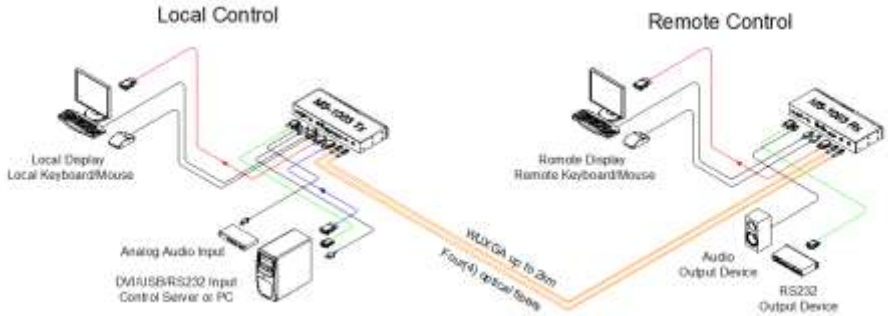



**Figure 1 – Overall connection of M5-1003 Optical KVM Extender**

## System Requirements for Setup

- **Hardware requirements**
  - **Local display and remote display should have same graphic resolution.**
  - You have a graphic controller card with a DVI port in your Windows/Mac (Mac is option), or SUN system. It should support the maximum graphic resolution feature of the display to be connected.
  - In case of using a computer, no special memory size, CPU speed and chipsets are required.
  - Proper initial trial of the entire platform with its application using a short length copper cable is recommended prior to install with the optical link.

- **Software requirements**
  - No special needs, if the DVI graphic controller and display peripheral are operational with the platform's OS and application.

- **AC/DC Power Adapter Technical Advisory**

**The power of M5-1003 is designed to supply to each module of Transmitter and Receiver modules by plugging to each of the power plugs.**

Up to 1.5km



## Installation

**Important: Please use the installation procedure below. Improper or no operation may result if the start-up sequence is not correctly followed.**

**Step 1**
Carefully unpack the contents of the shipping group.

**Step 2**
With system power turned off, connect the Transmitter module to the DVI receptacle of PC or other video source equipment by a DVI copper cable. If necessary, connect the RS-232 cable and the audio cable to D-sub 9-pin connector and audio jack.

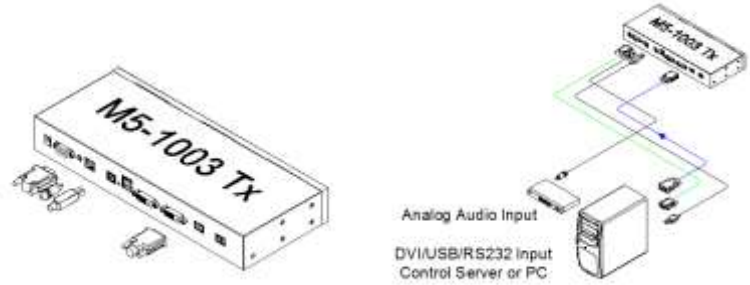



**Figure 2 – Connection of DVI, USB, RS-232 and Audio Cable to Transmitter Module**

**Step 3**
Connect the Transmitter module to the display, keyboard and mouse for local control. You may skip Step 3 if you don't need local control. In this case, please see instructions on page 1-6 for Self-EDID programming.

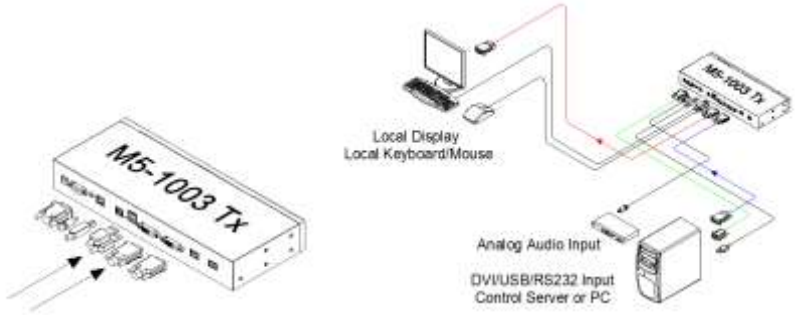



**Figure 3 – Connection of Local Display and Keyboard/Mouse**

**Step 4**

Connect the Receiver module to the remote display, keyboard and mouse. If necessary, connect the RS232 cable and the audio cable to audio output device and RS-232 device. For proper RS-232 cable type, please refer to Fig 10.

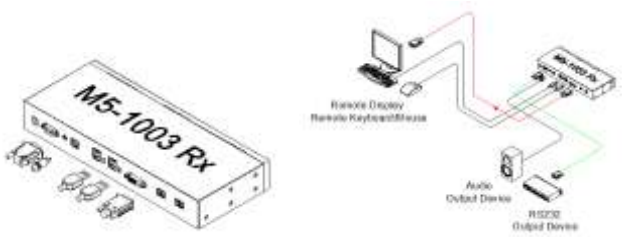



**Figure 4 – Connection of DVI cable, keyboard and mouse to Receiver Module**

**Step 5**

Remove dust covers and connect two(2) duplex LC fibers to LC receptacles of the Transmitter and Receiver modules, as shown in Fig. 5. Ensure the order of the duplex LC connectors is correct.

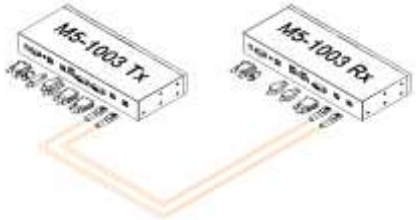



**Figure 5 – Connection of Two (2) Duplex LC Optical Fibers**

**Step 6**

Connect an AC/DC power adapter to both Transmitter and Receiver modules as your availability of AC outlets. You can find power indication LED lit on in the both modules.

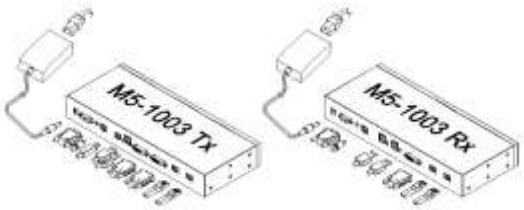



**Figure 6 – Connection of AC/DC Power Adapter**

**Step 7**

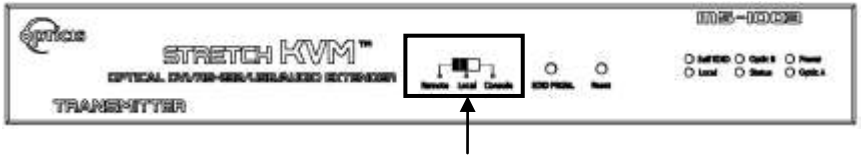
Power ON the PC and display. Power on connected USB, audio and RS-232 devices too. For proper RS-232 cable type, please refer to Fig 10.

**Tip 1:** Avoid “hot plugging” the Uplink as this is not recommended practice with live digital voltages.

**1-4 Installation**

# Operation Guide

**Selection of Control Position**




**Switch for decision of control position**

**Figure 7 – Switch for Selecting Control Position**

**Graphic data is always transmitted to both local DVI out and remote DVI out. However, USB port for keyboard and mouse is selectable for control at specific position.** Controllable site is like the table below with the position of switch on the front panel of transmitter.

| The position of Switch | Local Keyboard/Mouse (2 USB ports on Tx) | Remote Keyboard/Mouse (4 USB ports on Rx) |
|---|---|---|
| Remote | Disable | Enable |
| Local | Enable | Disable |
| Console | Control position is decided by console switch. | |

**Use of Console Switch and Indicator**

Console switch and indicator are optionally provided for easy and convenient control conversion. Connection is like below picture.

**Caution**

Please DO NOT look directly into the LC receptacles of Uplink module, while they are powered on, although they are regulated strictly enough to operate under the Laser Class 1, classified by CDRH/FDA for eye safety.

**1-5 Operation Guide**

## Self-EDID Programming Procedure

The graphic source equipment generally requires communication of display information (EDID). Display information (EDID) contains resolution and timing information for your display. Basically, **M5-1003 supports DDC2B with the local display.**

**M5-1003 also offers Self-EDID programming.** Self-EDID programming means that the EDID from the display is stored in the transmitter. You should use Self-EDID feature if you don't connect local monitor. Follow these steps to record the EDID of the display into the transmitter unit.

**Note1**: **If you know that EDID is not required by the source, Auto-EDID programming is not necessary.**

**Note2: The default EDID in factory ship-out is programmed in the VESA standard of UXGA (1600x1200) @60Hz.**

**Step 1**

Power on the display.

**Step 2**

Insert the included 12V DC power adapter into the transmitter.

**Step 3**

Push the EDID PRGM. button of the transmitter with a narrow pin. After three times blinking of Self-EDID LED, it will stay on.

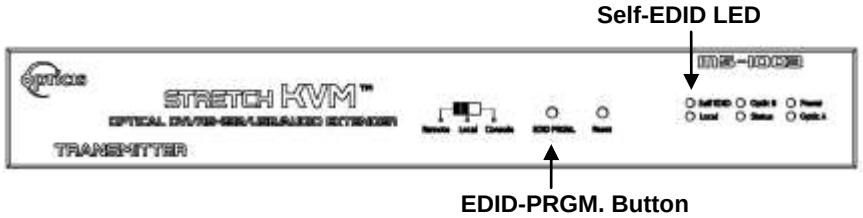



**Figure 9 – Position of EDID-PRGM. Button and Self-EDID LED**

**Step 4**

**Connect the Local Display port in transmitter to the display while turned on over DVI cable.** The LED on the front panel will begin to blink rapidly. Blinking indicates reading the EDID. LED will be turned OFF after blinking for about 8 sec. The monitor EDID has been recorded.

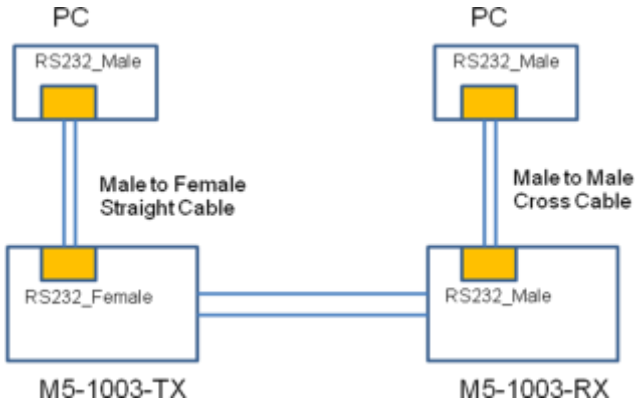
**Step 5**

Disconnect the transmitter from the display. Then, LED ON again.



## RS-232 Cabling

1. When you connect **PC to PC** over RS-232 with M5-1003, please use **male to female straight type** cable between PC and M5-1003-TX and **male to male cross type** cable between PC to M5-1003-RX.




2. When you connect **PC to RS-232 device (DUT)** over RS-232 with M5-1003, please use **male to female straight type** cable between PC and M5-1003-TX and **male to female straight type** cable between RS-232 device to M5-1003-RX.

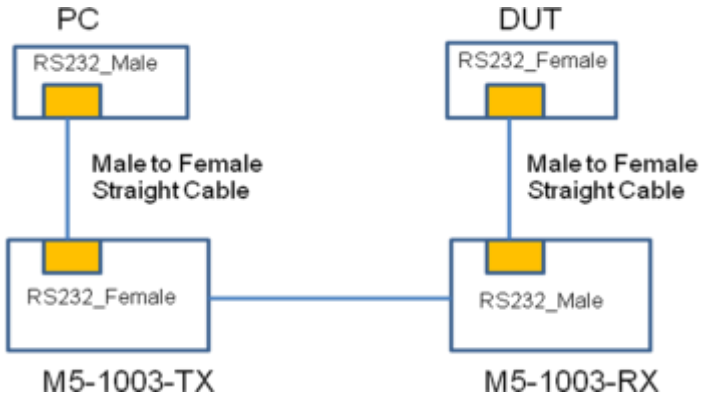



**Figure 10 – Proper RS-232 cable type around M5-1003**

## Troubleshooting

***The display shows only black screen.***

- Check that all AC and DC plugs and jacks used by external power supplies (both Opticis and others) are firmly connected.
- Ensure that power LED lit ON.
- Ensure that the Transmitter and Receiver modules connected correctly to the PC and display, respectively.
- Check if the PC and display are powered on and properly booted.
- Reset the M5-1003 using Reset button on Uplink and Downlink modules.
- Re-boot up the system after reconnecting the LC optical fibers.

***Screen is distorted or displays noises.***

- Check if the graphic resolution is properly set. Go to the display properties and tap the settings.
- Reset the M5-1003 using Reset button on Transmitter and Receiver modules.
- Reset the system.
- Power down, disconnect and reconnect the LC optical fiber or DC power adaptors, and power up.

## Maintenance

No special maintenance is required for this product. Ensure that this product is stored or used in a benign environment free from liquid or dirt contamination.

There are no user serviceable parts. Refer all service and repair issues to Opticis or its authorized distributor.

## Technical Support and Service

For commercial or general product support, contact your reseller. For technical service, contact Opticis by email techsupp@opticis.com or visit its website at www.opticis.com.



## Product Specifications

**M5-1003 Optical KVM Extender**

- **Compliance with DVI standard:** supports DVI 1.0 of DDWG, using fiber-optic communication links and DDC2B.
- **Compliance with USB 2.0 standard**
- **Extension limit:**

  - up to 2km (6,560ft) over two (2) duplex LC single-mode fibers.
  - up to 500m (1,640ft) over two (2) duplex LC multi-mode fibers.

- **Audio:**3.5mm analog stereo audio
- **RS-232:** D-sub 9 Pin
- **Fiber-optic Connection:** The transmitter and receiver boxes of M5-1003 have two (2) duplex LC receptacles connected to two (2) duplex Single Mode or Multi Mode optical patch cords.
- **Mechanical specifications of Transmitter and Receiver boxes**
  - **Dimensions:** 320 x 44 X 130mm (W/H/D)
  - **Weight:** 460 ± 10.0 gram for each of Uplink and Downlink module.
- **Environmental Specifications**
  - Operating temperature: 0°C to 50°C
  - Storage temperature: - 30°C to 70°C
  - Humidity: 10% to 85%

**AC/DC Power Adapter**

- **Power Input:** Universal AC 85-264V, 50/60Hz, AC power cord with power jack.
- **Power Output:** +12 V, 3.0 A SMPS DC-power Adapter
- **Cord DC Jack & length:** Core is 12 V and outer cylinder is GND. Length is 18.5 cm
- **AC Cord length: 1.8m**
- **Certification: PSE, UL, cUL, FCC, CE, TUV-GS**

## Warranty Information up

### 1 (One) Year Warranty

Opticis warrants this Digital Video/Audio and Serial I/O Optical Extender to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Opticis or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

All products that are replaced will become the property of Opticis.

Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the reminder of the initial warranty period, whichever is longer.

Opticis shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to Opticis for repair under warranty or not.

### Warranty Limitation and Exclusion

Opticis shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Opticis or its authorized agents, causes other than from ordinary use or failure to properly use the product in the application for which said product is intended.

### Dispose of Old Electrical & Electronic Equipment

(Applicable in the European Union and other European countries with separate systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



## Certifications

CE / FCC, Class 1 Laser Eye Safety

## Certification of Eye Safety

This laser product is inside implemented by using 1310, 1550nm LD Transceivers, manufactured by Opticis Co., Ltd., which are all certified by CDRH/FDA referred as classified in Laser Class 1 (IEC60825-1).

Caution – Use of controls or adjustments or performances of procedures other than those specified herein may result in hazardous radiation exposure.